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FIBER-CONTAINING DIETARY COMPOSITION  
[Shig'i'seom'yoo Ham'yoo Da'i'yeo'tuh Jo'seong'mool]

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## ABSTRACT

/1\*

The present invention provides a dietary composition having excellent effects in reducing weight as well as body fat and cholesterol. The composition comprises a main ingredient that is dietary fiber and secondary ingredients that are *Garcinia cambogia* extract, hibiscus extract, cascara sagrada, green-tea extract, and other additives.

## SPECIFICATION

### Detailed Description of Invention

#### Object of Invention

#### Field of Invention and Prior Art

The present invention relates to a fiber-containing dietary composition. More specifically, it relates to a fiber-containing dietary composition having excellent effects in reducing weight as well as body fat and cholesterol. /2

In the wake of economic development and advancements in the food industry, changes are starting to appear in food lifestyles that had once been predominantly vegetarian. Fat and calories are being ingested in amounts beyond necessity even as exercise amounts continue to decrease; and hypertension and other circulatory disorders that directly result from high-fat diets have been increasing such that obesity is becoming a society-wide problem.

Reduced consumption of dietary fiber due to the breakdown in traditional eating habits has given rise to obesity along with disorders of the digestive system. Because of growing concerns about health, dietary

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\* Number in the margin indicates pagination in the foreign text.

fiber, which had been ignored from the perspective of food nutrition, has come to attract interest for its relationship to adult diseases and as a corrective for obesity.

In the advanced countries of Europe and the United States, intestinal diseases such as colon cancer and constipation, and other disorders such as ischemic heart disease, atherosclerosis, diabetes, and cholelithiasis are common, while in developing countries the incidence of these diseases is relatively low. As it comes to be known that this correlation is related to the amount of dietary fiber regularly consumed, an interest in dietary fiber has arisen in food nutrition.

Dietary fiber refers to the component of food that cannot be digested by enzymes existing in the body. Recently, it has come to include pectin, lignin, hemicellulose, and cellulose composing the cell membranes of food. It is known that a meal of dietary fiber increases the secretion of saliva and improves feelings of satiety and that it plays a part in delaying digestive absorption, binding with bile acid in the intestinal tract, increasing beneficial bacteria in the intestinal tract, shortening passage time in the intestines, increasing the amount of stool, etc. Dietary fiber controls constipation and fullness such that colon cancer is abated, and it also reduces the concentration of cholesterol in the blood. The direct relationship between dietary fiber and obesity is in the fiber's effect of inhibiting fat absorption. Dietary fiber shortens the time it takes for ingested high-fat foods to pass the digestive tract and reduces bile-acid absorption and cholesterol as well as the breakdown of triglyceride food, thereby hampering the absorption of fat in the body.

Accordingly, if dietary fiber is consumed at the proper ratio, the absorption of cholesterol and hence its concentration in the blood can be reduced.

#### **Technical Task Invention Seeks to Accomplish**

Therefore, the technical task that the present invention seeks to achieve is the provision of a dietary composition having excellent effects in reducing weight as well as body fat and cholesterol.

#### **Constitution and Operation of Invention**

To achieve the aforementioned technical task, the present invention provides a dietary composition comprising a main ingredient of dietary fiber and secondary ingredients that are *Garcinia cambogia* extract, hibiscus extract, cascara sagrada, green-tea extract, and other additives.

The dietary fiber is one or more selected from the group consisting of psyllium husk powder, galactomannan, glucomannan, and beet fiber. It is contained in an amount that is 40-50 wt% of the total weight of the dietary composition.

In the present invention, based on the total weight of the dietary composition, the *Garcinia cambogia* extract is contained in the amount of 1-10 wt%, the cascara sagrada in the amount of 1-10 wt%, the hibiscus extract in the amount of 10-20 wt%, and the green-tea extract in the amount of 0.5-5 wt%, with the other additives having a total amount of 25-35 wt%.

The other additives are one or more from the group consisting /3  
of dichol, L-carnitine, yeast, powdered *Acanthopanax sessiliflorus*, oligosaccharide, silk protein, *Houttuynia cordata*, chitosan, lecithin,

spirulina, powdered Job's tears, citric acid, inorganic salt, and powdered red pepper. Here, it is preferred that the inorganic salt be one or more selected from among potassium chloride, dicalcium phosphate, and magnesium stearate.

The present invention's dietary composition comprises dietary fiber as a main ingredient and *Garcinia cambogia* extract, hibiscus extract, cascara sagrada, green-tea extract, and other additives as secondary ingredients. The dietary fiber used is one or more selected from the group consisting of psyllium husk powder, galactomannan, glucomannan, and beet fiber. The other additives include dichol, L-carnitine, yeast, powdered *Acanthopanax sessiliflorus*, oligosaccharide, silk protein, *Houttuynia cordata*, chitosan, lecithin, spirulina, powdered Job's tears, citric acid, powdered red pepper, and inorganic salt. The inorganic salt used is one or more selected from the group consisting of potassium chloride, dicalcium phosphate, and magnesium stearate.

Next, the ingredients making up the dietary composition and their functions shall be explained.

Dietary fiber refers to high-molecular compounds in food that are not dissolved by the digestive enzymes of humans. Because it abundantly contains fibrous material, it functions as a bulking agent, giving a feeling of satiety to the stomach. As an insoluble substance that is indigestible in the stomach and intestines, dietary fiber performs the role of absorbing and excreting fat that is not absorbed in the intestines. By suppressing appetite, it functions to impede ingestion of additional food, and when water is absorbed in a volume greater than usual, fiber

expands 20 to 60 times, such that stool increases in volume and is made smoother, which promotes intestinal movement and thus prevents the constipation that occurs during a diet.

The amount of dietary fiber that is the main ingredient in the present invention's dietary composition is 40-50 wt%, preferably 45-47 wt%, of the total weight of the dietary composition. If the content is less than 40 wt%, the effect of adding the fiber is insignificant; if it exceeds 50 wt%, it hampers the absorption of trace minerals such as iron, magnesium, and calcium.

The dietary fiber used in the present invention may be one or more selected from the group consisting of psyllium husk powder, galactomannan, glucomannan, and beet fiber, and preferably a combination of the four. When using all four ingredients, it is preferred that they be in the amount of 5-10 wt%, 3-5 wt%, 30-50 wt%, and 10-20 wt%, respectively.

The psyllium husk powder constituting the present invention's dietary fiber contains about 80% insoluble dietary fiber and is made from grinding the husks of psyllium seeds. Its outstanding bulkiness has focused attention on it as a dietary material. Ingestion of even trace amounts alleviates constipation, and it lowers cholesterol through excretion with fat and suppresses appetite by giving a feeling of satiety.

Galactomannan induces a feeling of satiety as well and smoothens intestinal functions. Glucomannan has a dietary-fiber content of about 90% internally; a soluble fiber, it is an ingredient extracted from edible konjac. It lengthens the time food stays in the bowels and blocks the expansion of contents in the intestinal tract, thereby suppressing the

functions of digestive enzymes and the absorption of nutrients in the body. Also, by absorbing bile acid, it performs the role of lowering the levels of solid fatty acids and cholesterol in the blood.

Beet fiber has a dietary-fiber content of about 60%. It is the substance that remains after sugar is extracted from dried sugar canes [sic]. By absorbing water and increasing volume, it relieves constipation. It also lowers the numbers for triglycerides and cholesterol in the liver and lymph.

The *Garcinia cambogia* extract that is one of the secondary ingredients constituting the present invention's dietary composition is taken from the rinds of the *Garcinia cambogia* fruit and powdered. It contains hydroxycitric acid (HCA), whose strength in binding to ATP citric acid lyase is more than 100 times that of citric acid. It thus plays a role in stopping the process in which excess carbohydrates are turned into fat. This results in reduced production of fatty acids and cholesterol, a slowed glycolytic pathway, and increased glycogen. The *Garcinia cambogia* extract is combined in an amount that is 1-10 wt%, preferably 3-5 wt%, of the total weight of the dietary composition. If the content /4 of the *Garcinia cambogia* extract is less than 1 wt%, the effect of adding it is insignificant; if it exceeds 10 wt%, its peculiar flavor negatively affects taste and is not recommended.

The cascara sagrada used in the present invention is from the bark of a tropical American tree that grows to 3-6 meters in height; the bark is peeled off between April and June and dried. It functions to stimulate intestinal mucosa, thus promoting intestinal peristalsis, and is a very

smooth laxative whose effect appears about 10 hours after ingestion. Its major advantage is that it has no other side effects even when ingested over a long period of time. It is preferred that the content of the cascara sagrada be 1-10 wt%, more preferably 5-7 wt%, of the total weight of the dietary composition. If the content is less than 2 wt%, the effect of adding it is insignificant. In the case of exceeding 10 wt%, though there is no known toxicity, it is not recommended for people with sensitive bowels.

The present invention's hibiscus extract is obtained by processing the red petals of the hibiscus called Chinese rose of Sharon. Like the *Garcinia cambogia* extract, its main ingredient is HCA at over 30%. HCA is an organic acid similar to citric acid. When present in liver cells, it interrupts the pathway by which surplus carbohydrates are synthesized to the spleen, preventing the synthesis of fat, such that energy production lengthens and the total amount of energy produced is increased. In particular, the amount of glycogen synthesized increases, which stimulates the hypothalamus and produces a feeling of satiety for appetite suppression; in promoting the breakdown of fat, it protects the acceleration of basal metabolic rates. It is preferred that it be contained in the amount of 10-20 wt%, more preferably 11-13 wt%, of the total weight of the dietary composition. If the content of the hibiscus extract goes beyond the given range, then the effect of its addition is not ideal.

Obtained from green tea having a very high catechin content, green-tea extract is known to suppress fat synthesis. It is preferred that its content be 0.5-5 wt%, more preferably 1-2 wt%, of the total weight of

the dietary composition. The green-tea extract's effect of inhibiting fat synthesis is superior when its content is within the given range.

The other additives constituting the present invention's dietary composition includes one or more selected from the group consisting of dichol, L-carnitine, yeast, powdered *Acanthopanax sessiliflorus*, oligosaccharide, spirulina, silk protein, *Houttuynia cordata*, chitosan, lecithin, powdered Job's tears, citric acid, powdered red pepper, and inorganic salt. Each of these ingredients is added in an amount by which its effect can be obtained. Their functions are examined next.

Dichol is a substance that lowers cholesterol numbers. L-carnitine promotes fat burning and hence is a diet aid; it has a role in the production of the energy source ATP in the body and functions to burn fat.

Yeast is known to be a plentiful store of vitamins and an excellent supply source for quality protein. For the present invention's dietary composition, chromium-containing yeast powder or brewer's yeast is preferred. Chromium is a mineral known for increasing the efficacy of insulin in the body and enhancing calorie expenditure, thereby being an aid in dieting.

Powdered *Acanthopanax sessiliflorus* is outstandingly effective as a stamina tonic, liver supplement, and poison remedy. It also stimulates the capacities of the body's organs, normalizes arterial blood pressure, and reduces blood glucose.

Oligosaccharides are isomalto-oligosaccharide, fructo-oligosaccharide, and galacto-oligosaccharide abundantly containing isomaltose, isomaltotriose, and panose. As a factor in the propagation

of bifidus, they alleviate constipation.

Silk protein is obtained from cocoon extracts. *Houttuynia cordata* has strong disinfecting and antidotal effects.

Chitosan, when absorbed in the body, is known to increase /5 immunity. When the body's immunity is increased, the body can be protected from pathogens and the incidence of illness may decline.

Lecithin may be able to prevent adult diseases attributable to cholesterol. Being an emulsifying agent that combines oil and water, lecithin emulsifies cholesterol and fat and thus prevents them from accumulating on blood-vessel walls. Accordingly, it helps in preventing diseases involving blocked blood vessels, such as atherosclerosis, heart disease, and hypertension.

Powdered Job's tears is remarkably diuretic, and since it strengthens the capacities of the liver and gall bladder, it can relieve swelling and jaundice.

Citric acid is a starting material in the Krebs cycle; it smoothen metabolism while at the same time rapidly excreting fatigue substances to clear up the blood, thereby being beneficial to circulation. Since cells are aged by fatigue substances such as lactic acid accumulating in the body, citric acid prevents atherosclerosis, hypertension, liver disorders, rheumatism, and other aging and adult diseases. Inhibited by citric acid, lactic acid is dissolved and excreted on account of calcium ions, thereby effectively suppressing adult diseases and aging. It has the effect of keeping blood slightly alkaline, i.e., it clears up the blood, and by naturally activating metabolism, all body functions come

to operate normally. By breaking down such substances as lactic acid, citric acid effectively allows the body to recover from fatigue. It maximizes natural healing and purifies acidic blood, thus being instrumental in a physical constitution that is strong and resistant.

Inorganic salt plays the role of controlling the concentration of ions in the body. For this substance, one can mention potassium chloride, dicalcium phosphate, magnesium stearate, or a combination thereof.

As another additive, powdered red pepper can also be used. Its vitamin A and C content is high and thus it heightens resistance against infection, increasing immunity, and promotes blood circulation.

Further, to improve the taste of the dietary composition of the present invention, one can add flavoring such as in the form of lemon powder. Moreover, various other additives may also be added for different purposes.

Below, the present invention shall be explained by citing an embodiment. However, the present invention shall not be limited by the following embodiment alone.

#### **Embodiment**

The dietary compositions in Table 1 below were prepared, and a clinical test was performed as follows.

As subjects for the test, only women who had had no particular internal or external illnesses in the past were selected. Their ages were in the range of 19-46 years, body fat ratios were excessive at 27.8-42.1%, and obesity rates were high at 22.49-33.79 in terms of body mass index (BMI).

The subjects were divided into three groups of ten persons each. The three groups each ingested the dietary composition labeled 1, 2, or 3 in Table 1. Based on interviews, the subjects were evenly distributed among the groups according to body constitution, obesity, etc.

TABLE 1

/6

INGREDIENT	DIETARY COMPOSITION		
	1	2	3
psyllium husk powder	12	10	11
glucomannan	27	26	28
beet fiber	8	9	7
<i>Garcinia cambogia</i> extract	3	5	4
cascara sagrada	5	6	7
hibiscus extract	11	12	13
powdered green-tea extract	2	2	1
dichol	4	2	2
L-carnitine	1	2	3
powdered <i>Acanthopanax sessiliflorus</i>	3	2	1
silk protein	4	4	3
<i>Houttuynia cordata</i>	5	4	3
chitosan	4	4	5
lecithin	2	3	3
citric acid	1	1	1
dicalcium phosphate	2	4	3
magnesium stearate	3	1	2
lemon flavor powder	3	3	3

Each of the dietary compositions in Table 1 was taken by subjects belonging to the respective group, in the morning and the evening in place of a meal. This was carried out for four weeks. All the subjects were told during the initial visit to keep a food diary. They were visited once a week to verify actual meal amounts. After four weeks of taking the dietary composition, the subjects had their blood tested and bodies measured in the same state as in the beginning, i.e., with stomachs having been empty for eight hours.

The items measured are given below. Each item was measured twice, once before the clinical trial and once four weeks after they started taking the composition.

Before the subjects were made to take the dietary composition, they were told the day before the test to keep their stomachs empty for eight hours. Then the next day, tests were performed on their heart, weight, waist and hip circumference, fat body weight, basal metabolic rate, blood, urine, etc.

The blood test measured total protein, blood urea nitrogen, cholesterol, triglycerides, HDL, high-density cholesterol, low-density cholesterol, potassium, calcium, hemoglobin, hematocrit, red blood cells, white blood cells, platelets, etc.

The urine test measured color, specific gravity, albumin, glucose, ketones, bilirubin, nitrite, blood, urobilinogen, red blood cells, white blood cells, epithelial cells, columnar cells, bacteria, crystals, etc.

The measurement method involved measuring body fat and basal metabolic rates with a body composition analyzer. Also for the blood and urine tests, blood and urine were taken after the subjects had fasted for eight hours, and then a general blood test and a urinalysis were done.

The results of the clinical trial are shown in Table 2.

TABLE 2

/7

ITEMS	DIETARY COMPOSITION		
	1	2	3
average weight (kg)	67.3	65.5	67.8
average weight loss (kg)	3.4	5.5	4.9
weight-loss ratio (%)	5.1	8.4	7.2
average body fat (kg)	2.25	6.6	4.9
average body-fat loss (kg)	2.0	6.0	4.4
average body-fat loss ratio (%)	88.8	90.9	89.8
basal-metabolic-rate change (%)	-0.23	-0.15	-.021

From Table 2, it can be known that taking the three dietary

compositions resulted in substantial loss of body weight and of body fat as well.

Further, measurements of the subjects' bodies showed that waist and hip circumferences also significantly decreased. Based on these facts, it can be inferred that the loss of body weight lay in the reduction of body fat. In particular, since waist circumference decreased, it can be assumed that visceral fat also decreased.

It can also be known from Table 2 that taking the given dietary composition caused little reduction in basal metabolic rates.

Measurements were also able to confirm that the concentration of cholesterol in the blood was reduced.

According to measurements of the subjects' blood pressure and pulse, the pulse remained normal and blood pressure was significantly reduced. It could thus be confirmed that in addition to the given dietary compositions having the effect of safe weight loss, they also have beneficial results on the circulatory system.

#### **Effect of Invention**

The present invention's dietary composition can achieve weight loss almost without slowing down the basal metabolic rate while on the diet. It can also provide increased reduction in body fat and cholesterol.

#### **(57) CLAIMS**

##### **Claim 1**

A dietary composition comprising a main ingredient that is dietary fiber and secondary ingredients that are *Garcinia cambogia* extract, hibiscus extract, cascara sagrada, green-tea extract, and other additives.

#### Claim 2

The dietary composition in Claim 1 wherein said dietary fiber is one or more selected from the group consisting of psyllium husk powder, galactomannan, glucomannan, and beet fiber, contained in an amount that is 40-50% of the total weight of the dietary composition.

#### Claim 3

The dietary composition in Claim 1 wherein said additives are one or /7 more from the group consisting of dichol, L-carnitine, yeast, powdered *Acanthopanax sessiliflorus*, oligosaccharide, silk protein, *Houttuynia cordata*, chitosan, lecithin, spirulina, powdered Job's tears, citric acid, inorganic salt, and powdered red pepper.

#### Claim 4

The dietary composition in Claim 3 wherein said the inorganic salt is one or more selected from among potassium chloride, dicalcium phosphate, and magnesium stearate.

#### Claim 5

The dietary composition in Claim 1 wherein, based on the total weight of said dietary composition, said *Garcinia cambogia* extract is contained in the amount of 1-10 wt%, said cascara sagrada in the amount of 1-10%, said hibiscus extract in the amount of 10-20 wt%, and said green-tea extract in the amount of 0.5-5 wt%, with the total amount of said other additives being 25-35 wt%.